P-029

Police Modifier Bulletin

SVE BULLETIN

SPECIAL VEHICLE ENGINEERING – BODY BUILDERS ADVISORY SERVICE

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Date: 16 December, 2019

2017 and Beyond Police Interceptor Utility

Programming and Configuration

Rear Traffic Advisor Light Bar (Option 96T) and Front Visor Light Bar (Option 96W)

Models Affected
2017MY and Beyond Utility Police Interceptor

Purpose
Provide information describing the software to configure the Rear Traffic Advisor Light Bar and the Front Visor Light Bar.

Document Containing Programming and Configuration Information
See document: *2017 and Beyond Police Interceptor Utility Program and Configuration for Rear Traffic Advisor Light Bar (Option 96T) and Front Visor Light Bar (Option 96W)*.

Tools Needed
Computer, USB cable type Mini B connection (minimum 2'), and software.
The following is the link to install the SoundOff Signal Light bar Configurator.

You will need an internet connection to install from the following:
http://software.soundoffsignal.com/nForce/Lightbar Configuration Utility/setup.exe

Programming and Configuration

Rear Traffic Advisor Light Bar (Option 96T) and Front Visor Light Bar (Option 96W)

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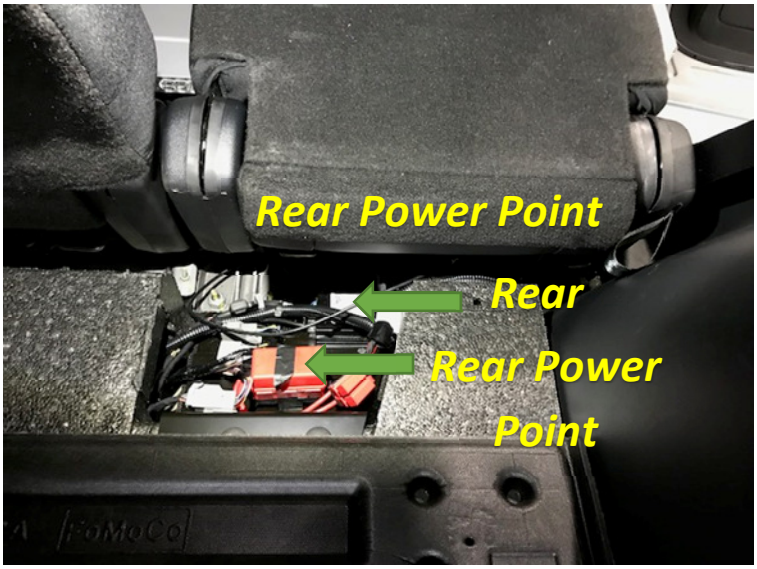
Breakout Box Connection to PC

Breakout Box Location

Location of the Breakout Box (BOB) is under the floor mat behind the second row seat, (See Figure 1 - Breakout Box (BOB) location).

Figure 1 - Breakout Box (BOB) location near 2nd row seat



Plug the USB cable type Mini B into the PC and Breakout Box. See Figure 2 - Breakout Box Assembly and Figure 3 – Breakout Box (BOB) Mini USB Connection.

Figure 2 - Breakout Box Assembly

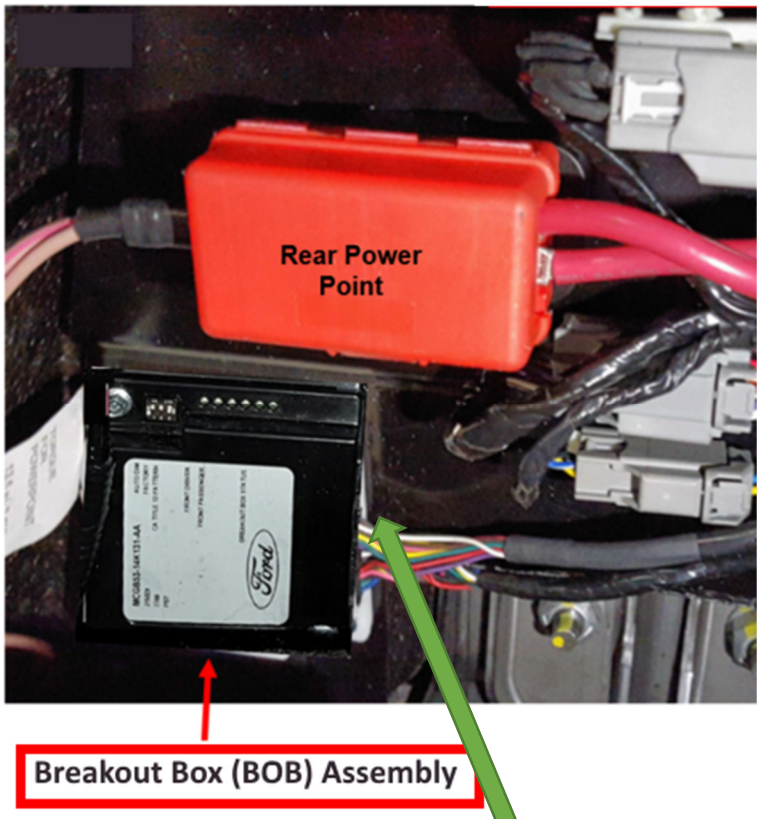


Figure 3 – Breakout Box (BOB) Mini USB Connection

Change Breakout Box DIP Switch Setting

The Breakout Box DIP switch #2 ***must*** be set to Custom Mode (OFF) for custom software configuration. (See Figure 4 - Breakout Box DIP Switch Setting)

Figure 4 - Breakout Box DIP Switch Setting

DIP Switch	Status
1	On or Off
2	**OFF**
3	On or Off

SoundOff Light Bar Configuration Software

Software Start

Software must be installed on the PC before continuing. Please see link below.

You will need an internet connection to install from the following:
http://software.soundoffsignal.com/nForce/Lightbar Configuration Utility/setup.exe

Once software is installed, double click the SoundOff Signal Light bar Configurator icon. (See Figure 5 - Software Icon)

Figure 5 - Software Icon

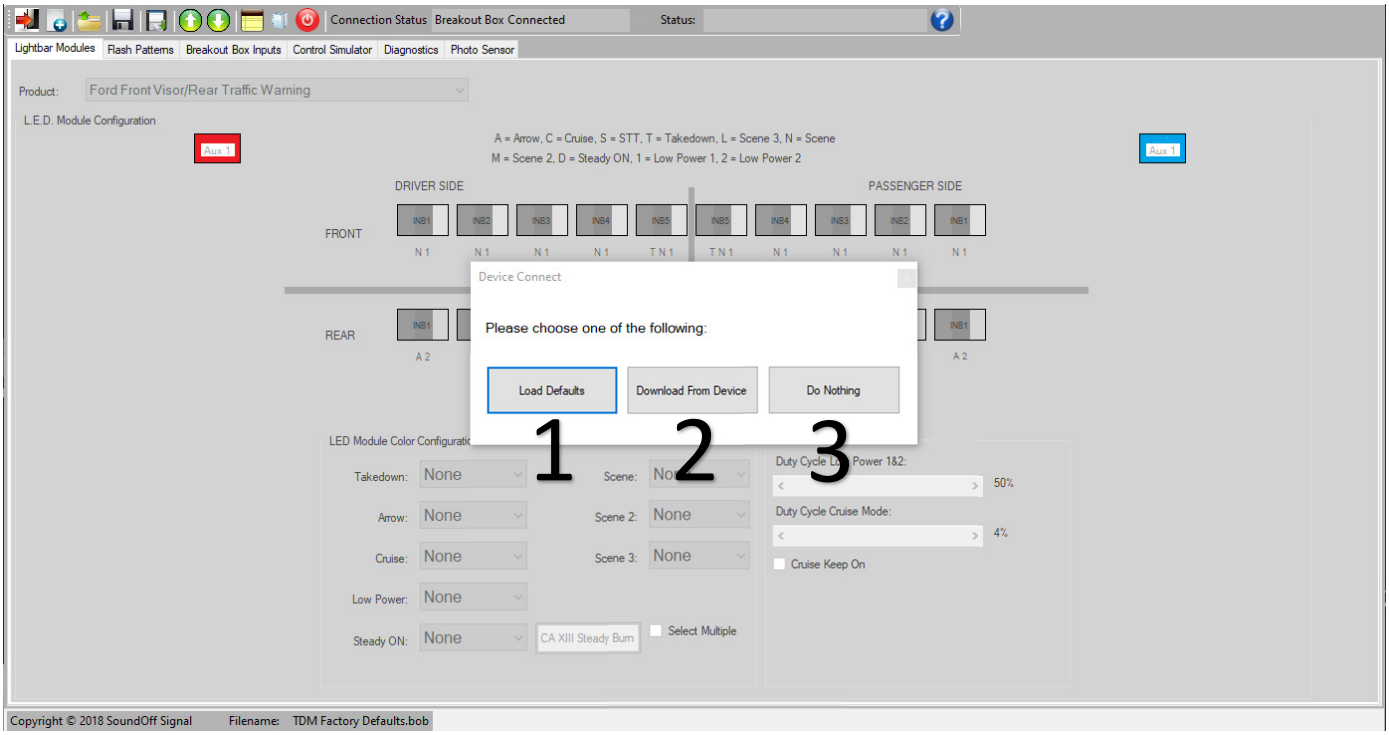
Once software starts, a “Product Type Changed” pop-up will appear. This is asking if you had a configuration file you were working on, if you would like to save it before you change to the Ford setup.

- Clicking yes will open a new window to save the previous configuration
- Clicking no will move to the next step

“Please choose one of the following” pop-up will appear (See Figure 6 - Initial Screen):

1. Load Defaults – Loads a default configuration of the Ford Front Visor/Rear Traffic Warning Light bar into the software.
2. Download From Device – Downloads the configuration from the Breakout Box (BOB)
3. Do Nothing – Closes the dialog without doing anything.

Figure 6 - Initial Screen



LED Module Color Configuration

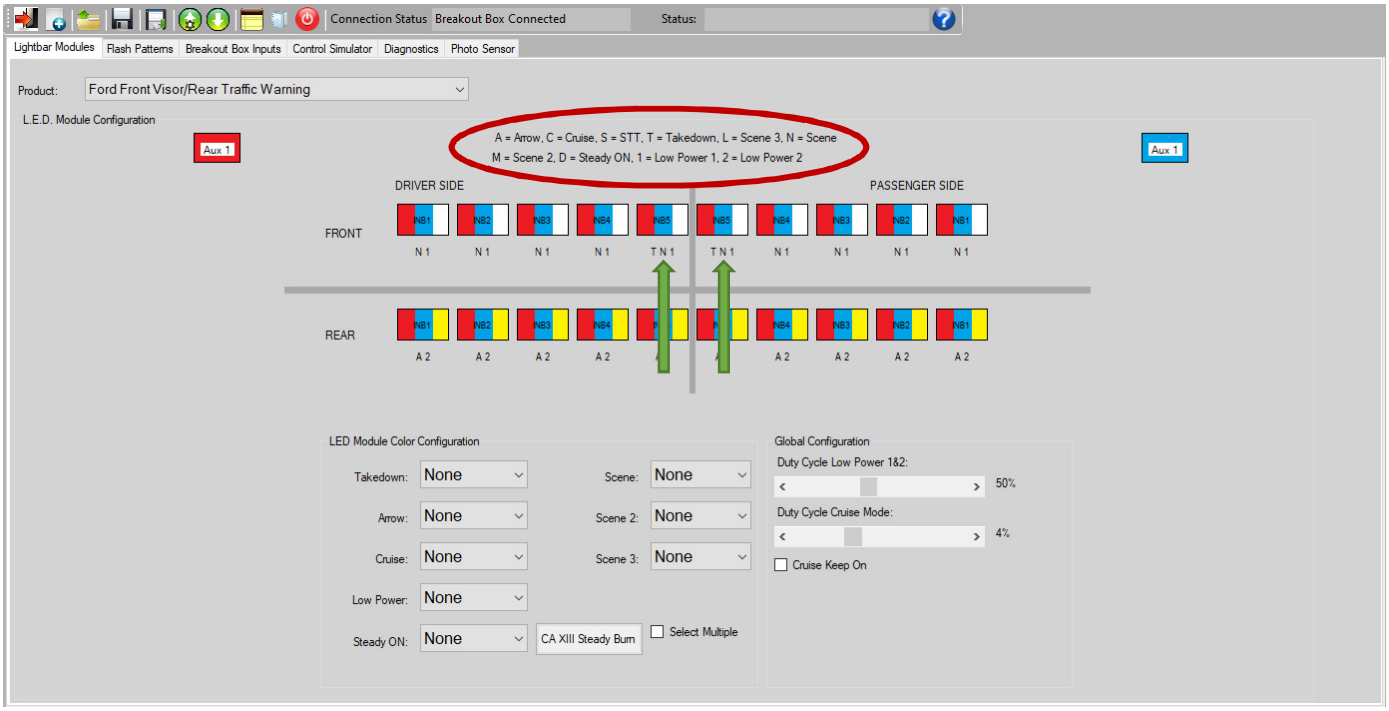
Light Bar Modules Legend

Note:

- The light bar modules factory default configured color setup is red, blue, and white in the front of vehicle and red, blue, and amber in the back of vehicle.

The light bar module legend depicts the LED Module Color configuration per module. Each module can be configured to a function and color. Functional examples are scene, cruise, or arrow. Selecting a color of the function will cause that color to activate during the function. In Figure 7 - Module Color Configuration Legend you see that the Front Inboard 5 modules are both set to TN1. This depicts Takedown, Scene, and Low Power 1 functionality.

Figure 7 - Module Color Configuration Legend



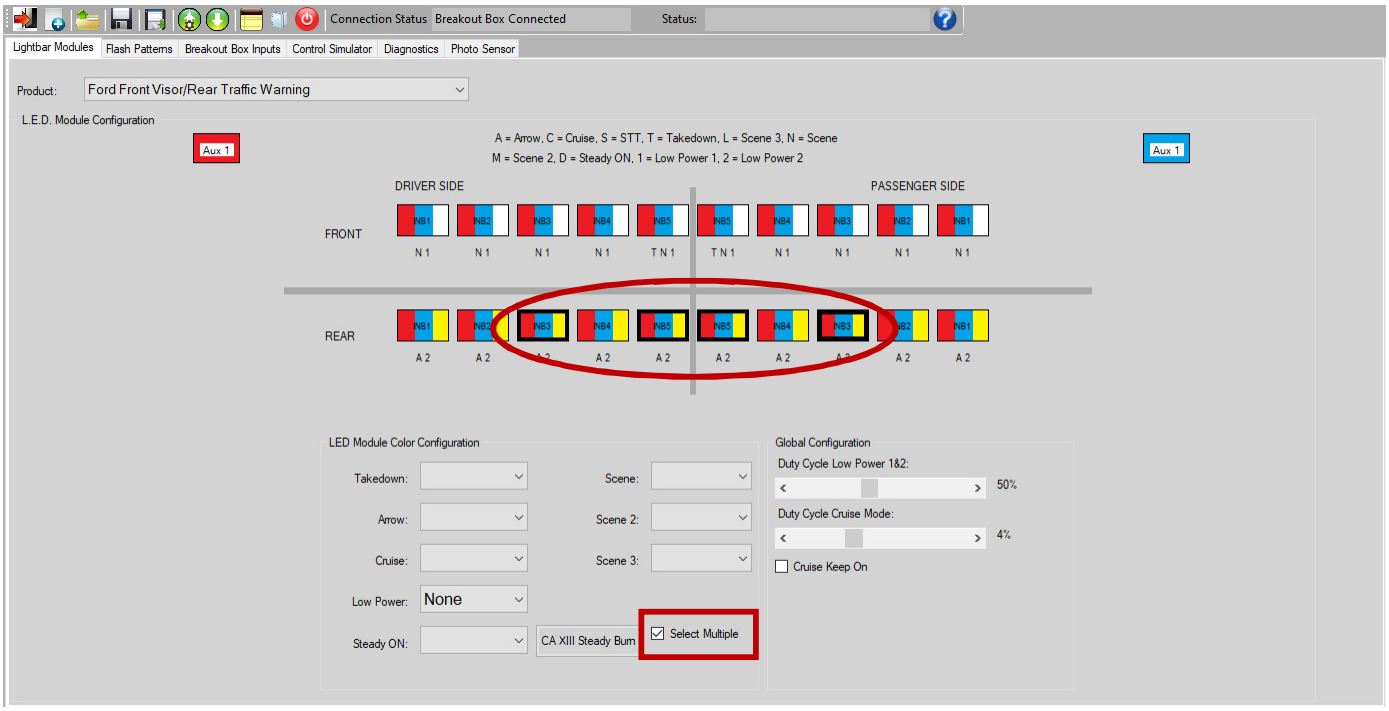
Programming and Configuration

Rear Traffic Advisor Light Bar (Option 96T) and Front Visor Light Bar (Option 96W)

LED Module Configuration

To configure an LED Module, first choose the module to change, including the front Auxiliary Lights (AUX) (Figure 8 - LED Module Configuration). The module border will show which module is currently chosen. In the LED Module Color Configuration section, choose the functionality and color for the module. The module will show the configuration in the letters and numbers below the selected module. The Select Multiple check box in the LED Module Color Configuration section allows you to configure multiple modules at once.

Figure 8 - LED Module Configuration

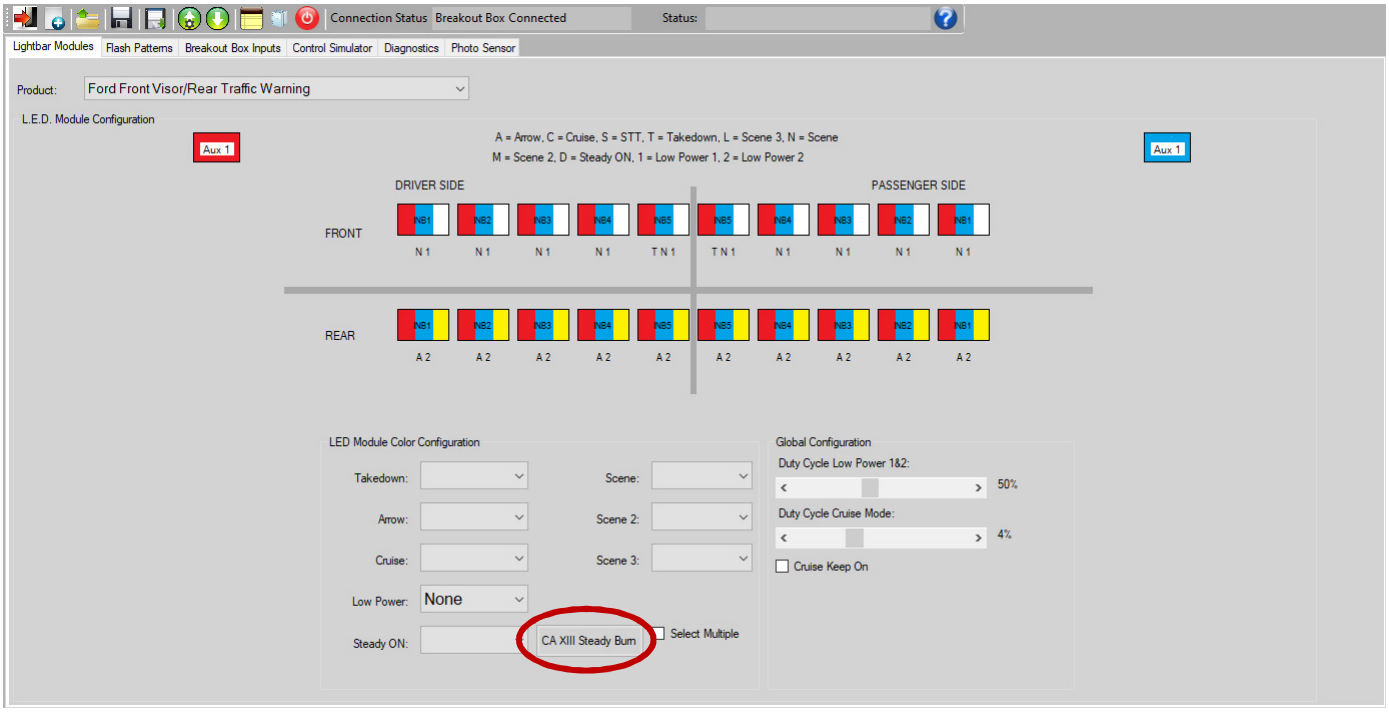


California Title 13 Option

CA XIII Steady Burn – Clicking allows the selection of a module and an input wire to setup the California Title 13 steady burn requirement. (See Figure 9 - CA XIII Button)

California Title 13 Button

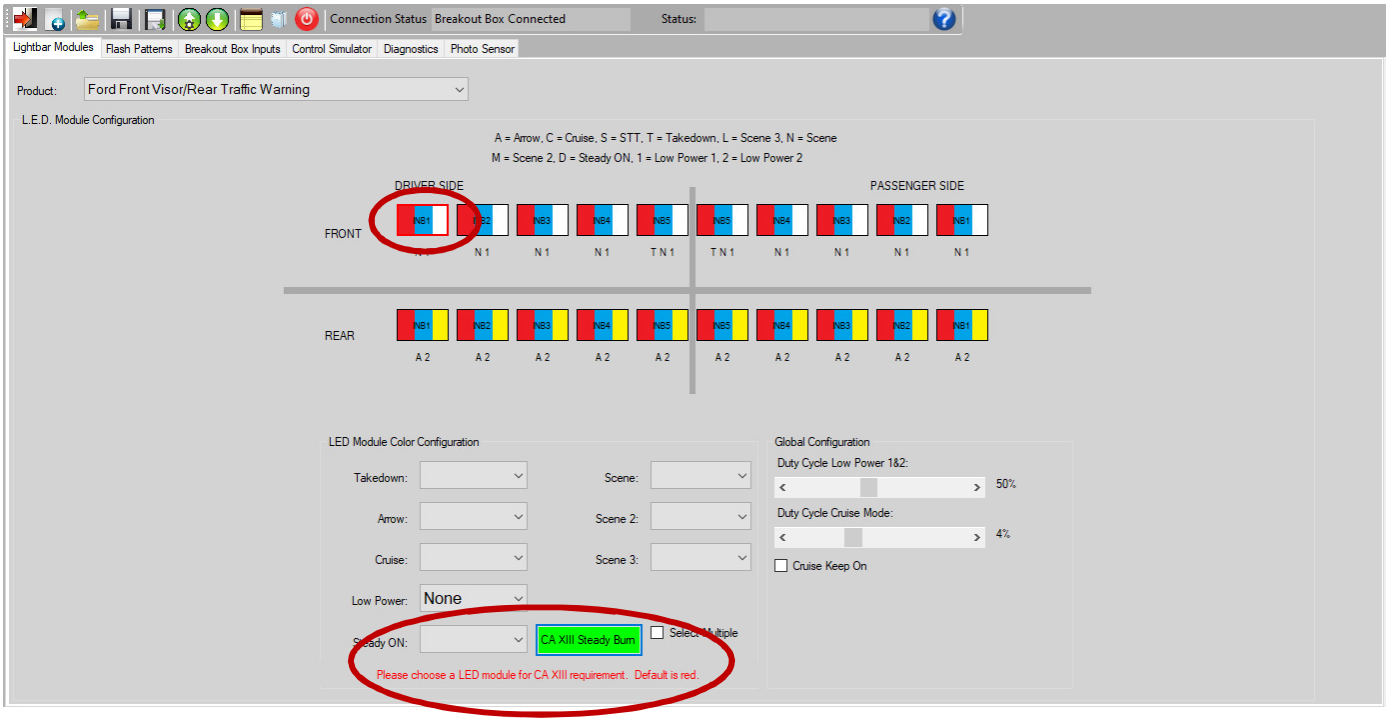
Figure 9 - CA XIII Button



California Title 13 Module Selection

When the CA XIII Steady Burn button is selected, the button will turn green and the default module's border will turn red (See Figure 10 - CA XIII Steady Burn Selected). Select the module desired for the California Title XIII requirement (only front visor light modules can be chosen to satisfy this requirement).

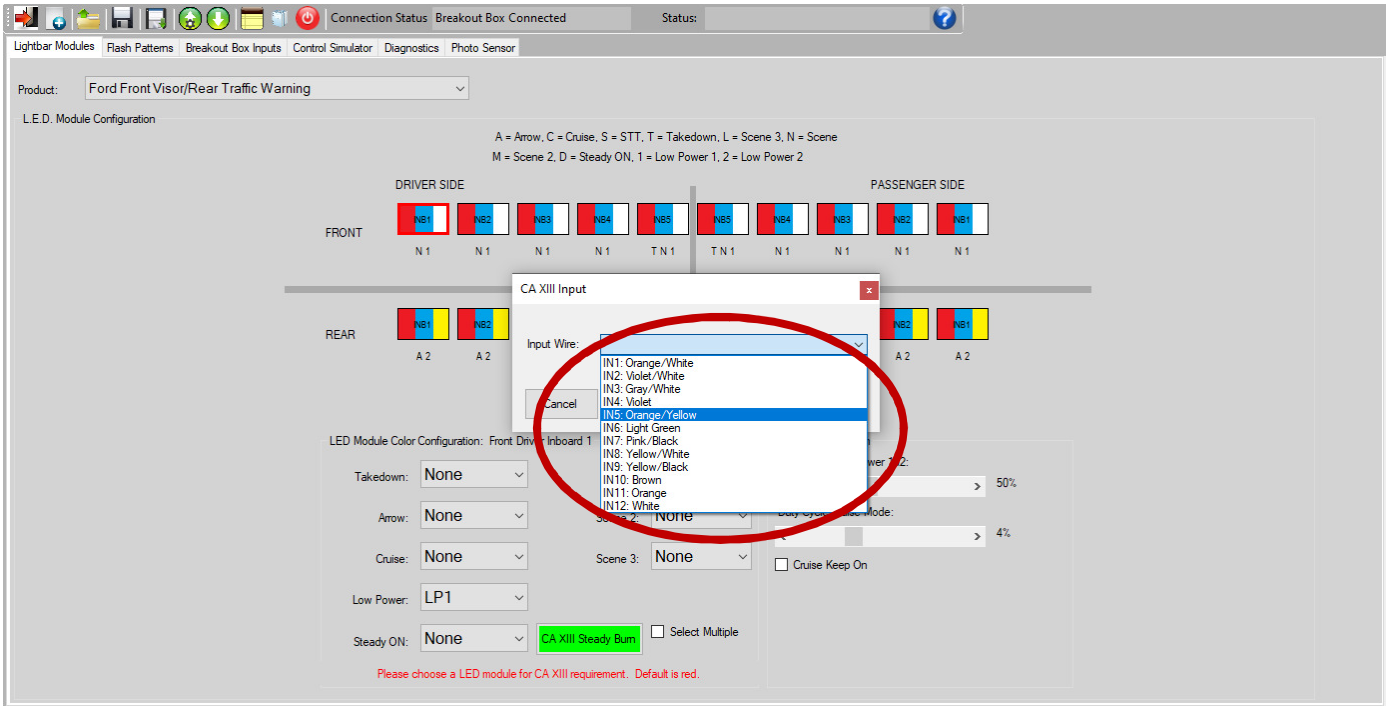
Figure 10 - CA XIII Steady Burn Selected



California Title 13 Select Input Wire

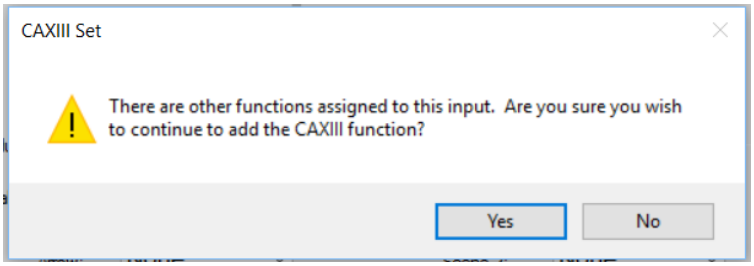
After selecting the module to be configured to satisfy the California Title XIII requirement, choose an Input Wire that will need to be connected to ignition power source on the vehicle. In Figure 11 - CA XIII Input Wire Selection, the Orange/Yellow wire from the Breakout Box (BOB) will need to be connected to the ignition power source.

Figure 11 - CA XIII Input Wire Selection



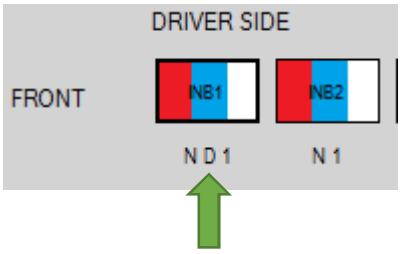
If the wire is already set for a different function, it will prompt for a confirmation (See Figure 12 - California Title 13 Dialog). If “Yes” is chosen, the input will now have two functions setup. This means that the ignition wire will now activate both functions. Please check to make sure this is the desired result. If not, go to the Breakout Box Inputs tab and remove the undesired ignition source function.

Figure 12 - California Title 13 Dialog


CAXIII Set
There are other functions assigned to this input. Are you sure you wish to continue to add the CAXIII function?
Yes
No

Once setup, the CA XIII button sets a “Steady On” function (See Figure 13 - California Title 13 Designation), defined by the letter “D” under the module, using the color Red, for the input wire selected.

Figure 13 - California Title 13 Designation

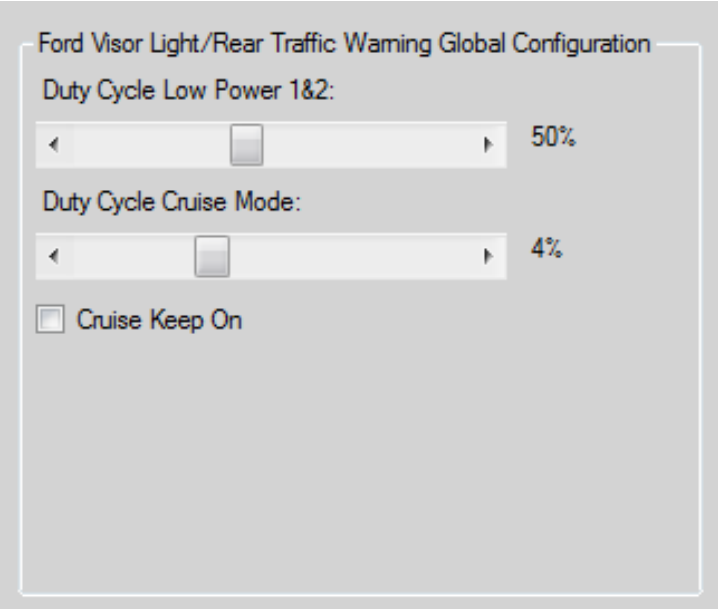


Duty Cycle

The intensity of the light can be controlled by the Low Power 1 & 2, and the Cruise mode settings. The lower the percentage that is set, the less intensity of the light output. Duty cycles for the Low Power 1 & 2 range is 20 – 90%. Duty cycles for the cruise function range is 1 – 10%. (See *If the "Cruise Keep On" checkbox is marked (See Figure 14 - Duty Cycles and Cruise On), all of the light modules that are assigned to the Cruise function will transition to the cruise level instead of off during the off portions of active flash patterns.* Figure 14 - Duty Cycles and Cruise On)

Cruise Keep On

If the "Cruise Keep On" checkbox is marked (See Figure 14 - Duty Cycles and Cruise On), all of the light modules that are assigned to the Cruise function will transition to the cruise level instead of off during the off portions of active flash patterns. *Figure 14 - Duty Cycles and Cruise On*



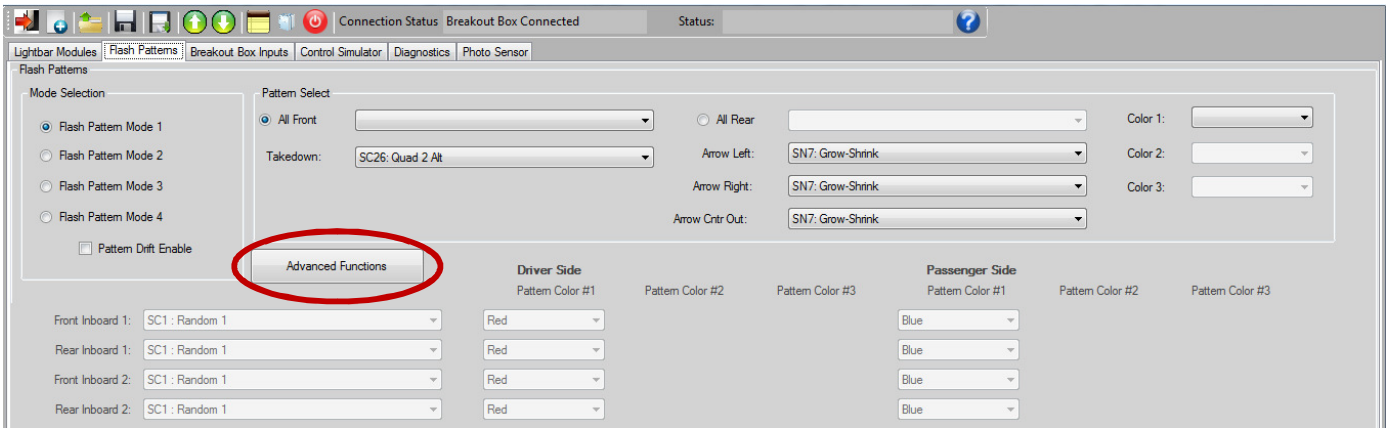
Programming and Configuration

Rear Traffic Advisor Light Bar (Option 96T) and Front Visor Light Bar (Option 96W)

Flash Patterns

Flash patterns are controlled via the Pattern Select group box when the "Advanced Features" button is disabled (See Figure 15 - Flash Pattern Advanced Functions).

Figure 15 - Flash Pattern Advanced Functions



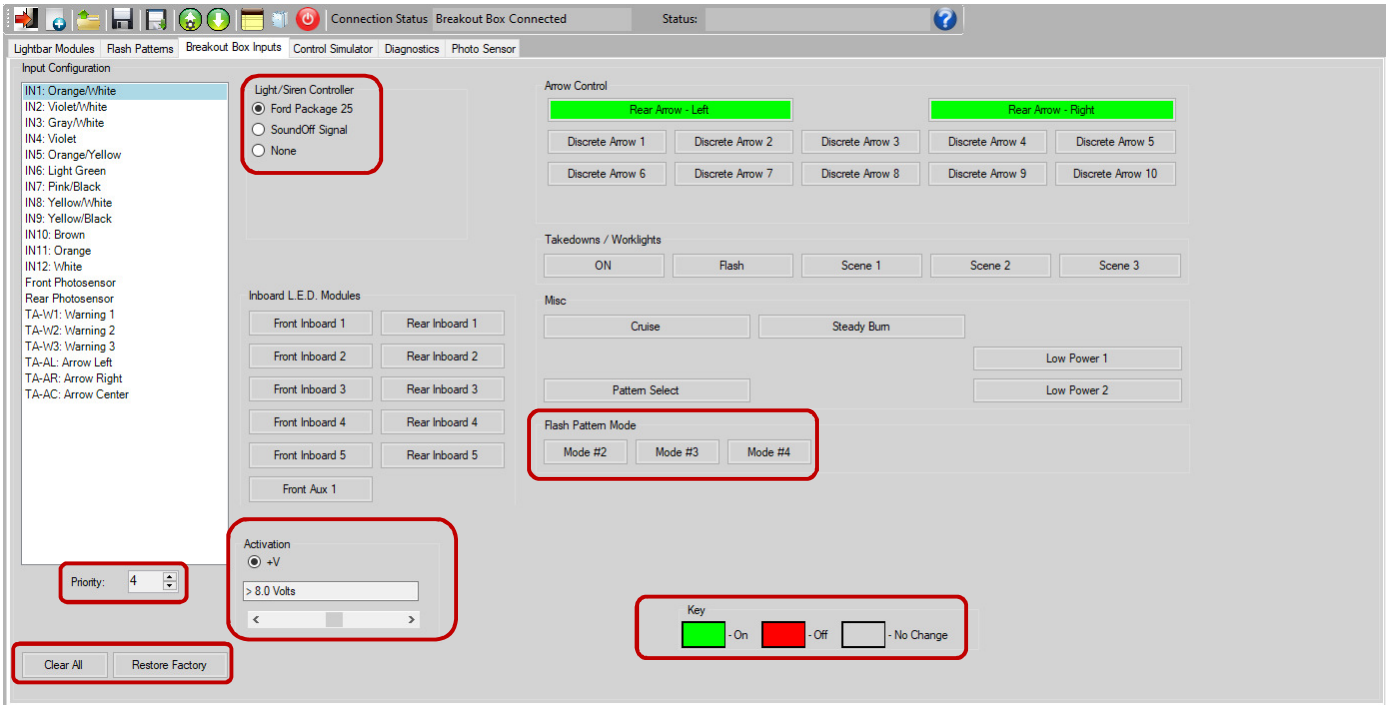
1. Flash Patterns are designated with a pattern code. This is the type of flash pattern:
    a. Example: SC9: Slow Runner
        i. Letter S: Single color pattern
            1. Letter D: Dual color pattern
            2. Letter T: Tri color pattern
        ii. Letter C: SAE Compliant
            1. Letter N: Non-Compliant
        iii. Number 9: 9th pattern in list of single color
2. Top left, Mode Selection: This allows the user to assign different flash patterns to different modes that can be activated using the BOB input wires.
    a. Example:
        i. Mode 1 as a slow single color
        ii. Mode 2 as a fast tri color
        iii. Mode 3 as a fast dual color
3. On the top center:
    a. Select "All Front" or "All Rear"
        i. Select the dropdown menu and choose your pattern.
        ii. On far right, choose the color/colors you want on this pattern
    b. Watching the bottom part, you will see the pattern name, and colors, change per your choices on the above.
4. If you click on the "Advanced Functions" button, you are able to assign different flash patterns to each module using the bottom portion of this window
    a. Note: The rear inboards must all flash the same color on the inboards. If you change one, the other rear inboards will change also.
    b. Choose your pattern
    c. Select your color

Breakout Box Inputs

Notes (See Figure 16 – Breakout Box Inputs):

- Breakout box input options change with the “Light/Siren Controller” chosen.
- “Clear All” button: This will remove all functions that have been assigned to the wires and virtual buttons.
- “Restore Factory” button: This will re-assign the factory default functions that were assigned to the wires and virtual buttons.
- Priority: Priority levels are 1-5, with 5 being highest priority. This setting can be assigned to each individual wire and virtual button.
- “Activation”: This allows the user to set a lower, or higher, voltage threshold for activation of the wires.
- “Flash Pattern Mode”: These are used based on the Flash Pattern changes you did on the Flash Pattern tab. Default mode is Mode #1, this is the reason it is not visible
- Key (located center bottom):
    - Green: will turn the function on
    - Red: will force the function off
    - Grey/Empty: has no affect

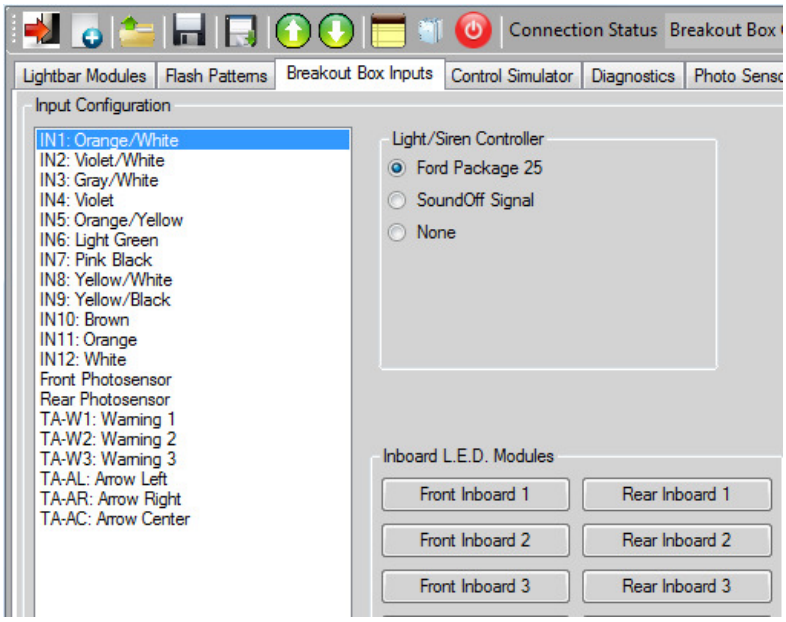
Figure 16 – Breakout Box Inputs



Light/Siren Controller: Ford Package 25

This selection is used when the vehicle has the Ford Package 25 installed (See Figure 17 - Breakout Box Inputs Ford Package 25).

Figure 17 - Breakout Box Inputs Ford Package 25



1. To assign functions to the wires, or virtual buttons:
    a. Highlight wire on left side of screen: Assigned functions will appear Green
    b. Add/remove desired functions by clicking on the buttons. Clicking on the button will scroll through Green, Red, and Grey.
    c. More than one function is able to be assigned to individual wires and buttons.
        i. Example: Default function for IN4: Violet is to turn on Takedowns (See Figure 18 – Default Function). The user can turn on the warning for the rear bar in Flash Pattern Mode #2 as well (See Figure 19 – Function Example).

Figure 18 – Default Function

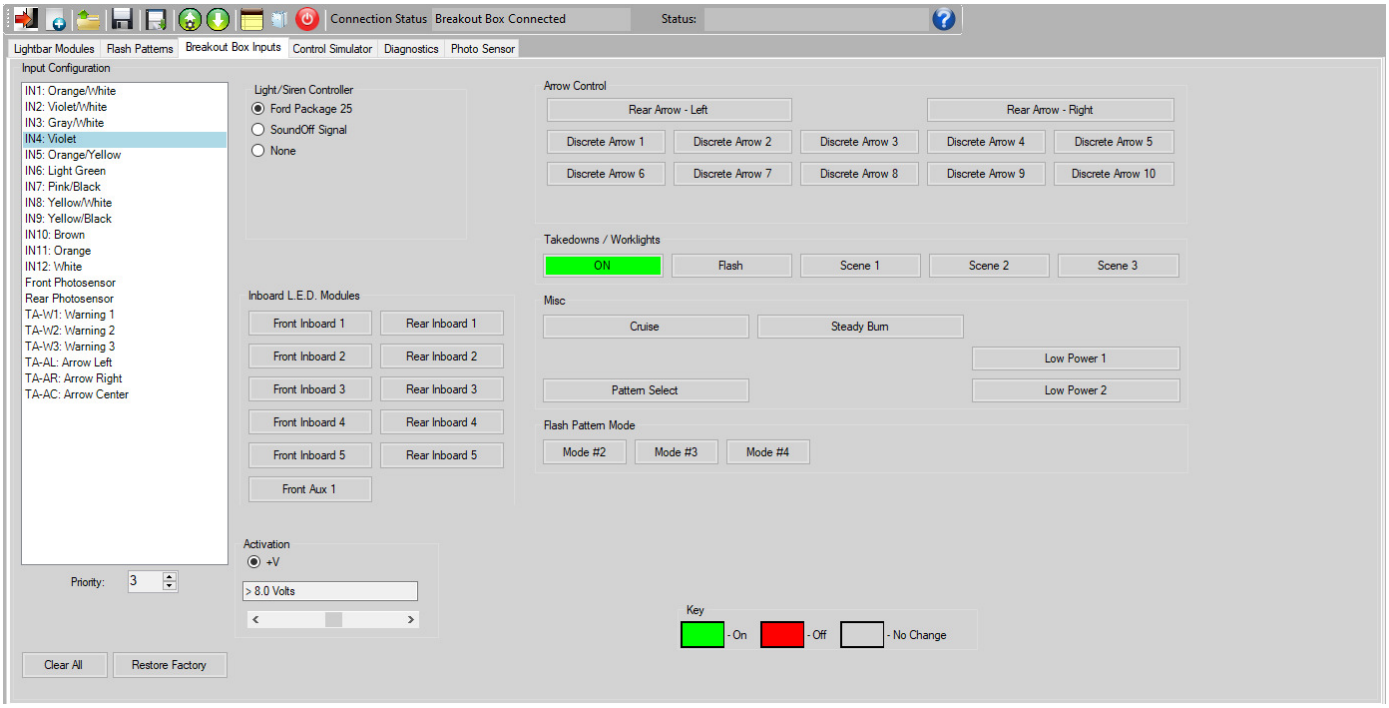
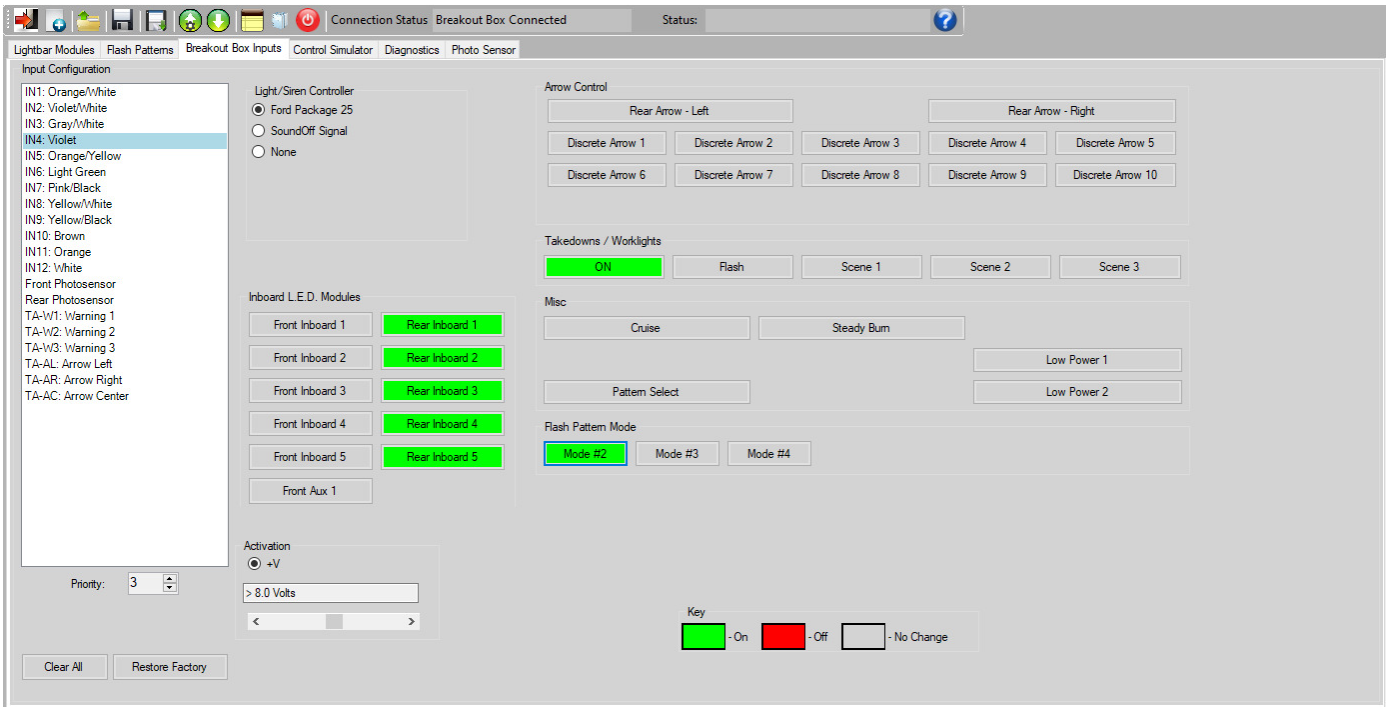


Figure 19 – Function Example

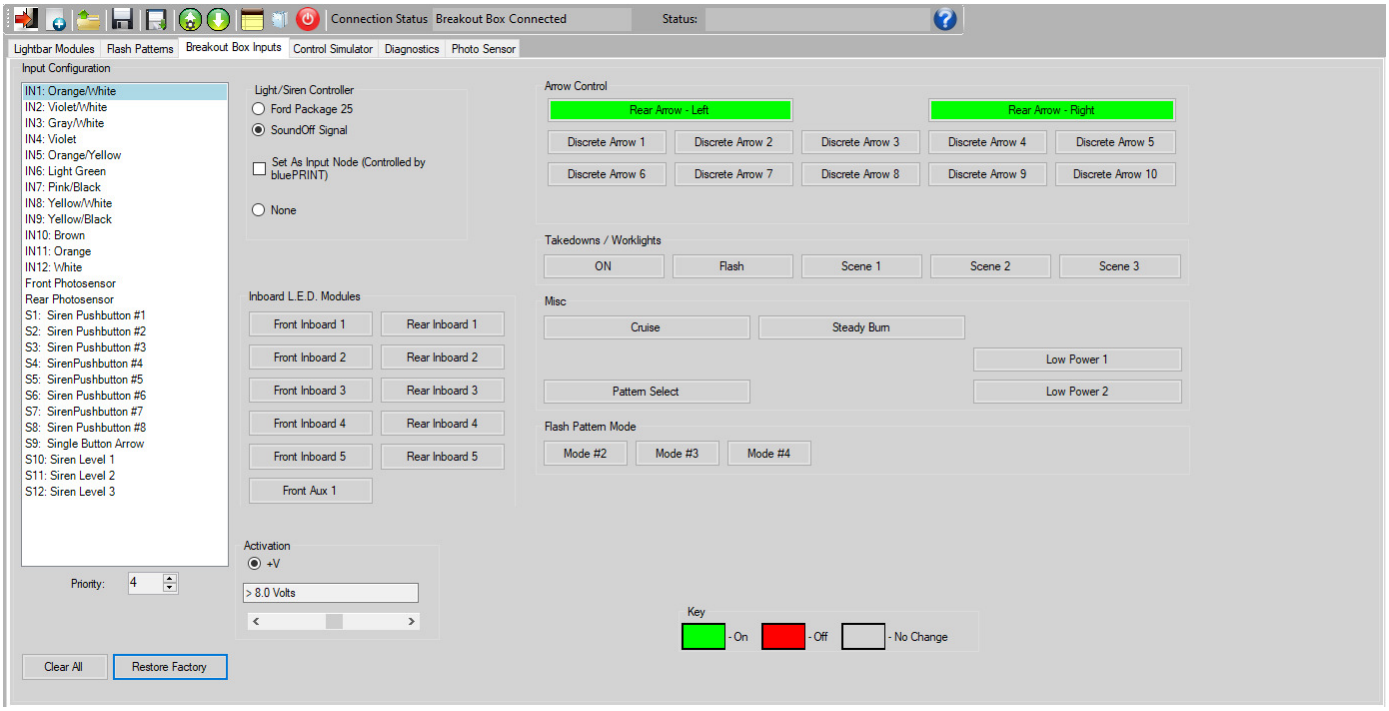


Light/Siren Controller: SoundOff Signal

This option integrates the functions of the light bars with the 400 Series Siren Controllers, or the BluePrint Control System. (See Figure 20 - Breakout Box Inputs SoundOff Signal)

1. SoundOff Signal selected, with “Controlled by BluePrint” not checked.
    a. To assign functions to the wires, or virtual buttons:
        i. Highlight wire on left side of screen: Assigned functions will appear Green
        ii. Add/remove desired functions by clicking on the buttons. Clicking on the button will scroll through Green, Red, and Grey.
    b. More than one function is able to be assigned to individual wires and buttons.
2. SoundOff Signal selected, with “Controlled by BluePrint”
    a. All of the assigned functions will be set to “No Change.” Nothing will be activated via the wires, or virtual buttons

Figure 20 - Breakout Box Inputs SoundOff Signal

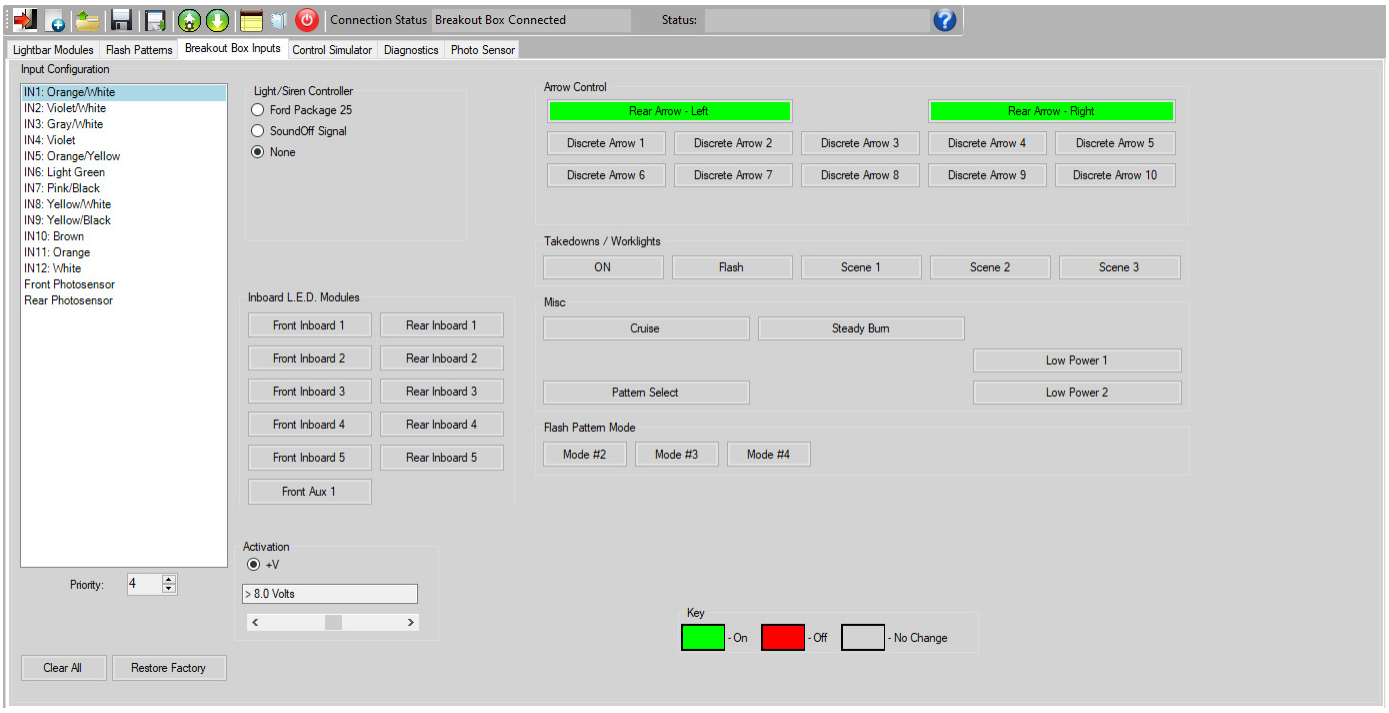


Light/Siren Controller: None

This option is used for all other types of activation systems (See Figure 21 – Breakout Box Inputs None)

1. To assign functions to the wires:
    a. Highlight wire on left side of screen: Assigned functions will appear Green
    b. Add/remove desired functions by clicking on the buttons. Clicking on the button will scroll through Green, Red, and Grey.
2. More than one function is able to be assigned to individual wires and buttons.

Figure 21 – Breakout Box Inputs None



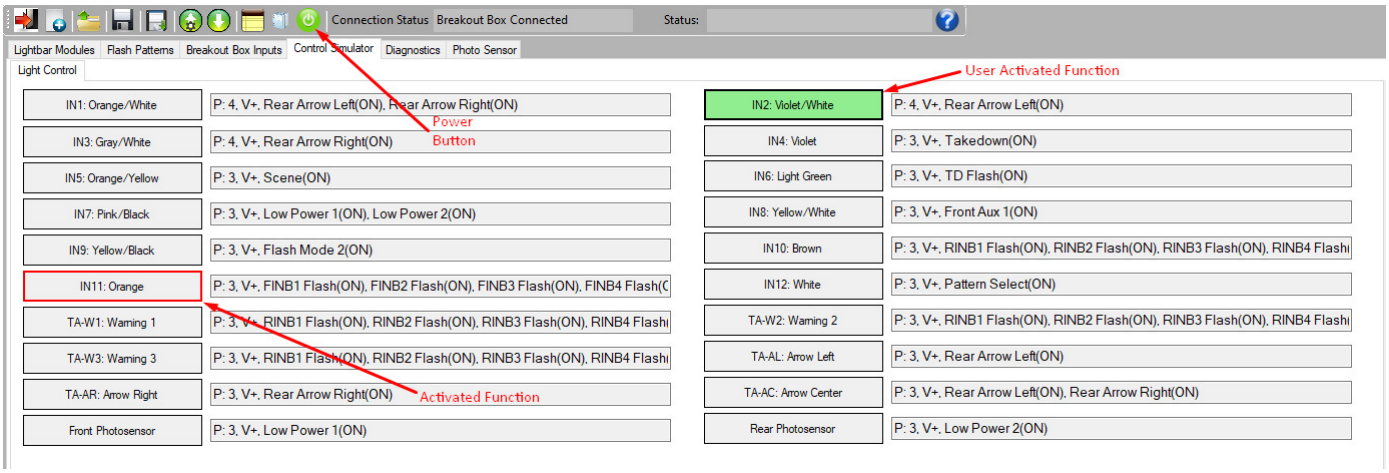
Control Simulator

The function of this tab is to allow the user to test the light bar, diagnose activation wires, and see assigned functions to the wires and virtual buttons.

Notes:

- Control Simulator options will change with the Breakout Box Inputs - Light/Siren Control chosen on the Breakout Box Inputs tab.
- Control Simulator will not work unless the “Power Button” is Green (See Figure 22 - Control Simulator)

Figure 22 - Control Simulator


Connection Status
Breakout Box Connected
Status:
Lightbar Modules
Flash Patterns
Breakout Box Inputs
Control Simulator
Diagnostics
Photo Sensor
Light Control
Power Button
User Activated Function
Activated Function
IN1: Orange/White
P: 4, V+, Rear Arrow Left(ON), Rear Arrow Right(ON)
IN3: Gray/White
P: 4, V+, Rear Arrow Right(ON)
IN5: Orange/Yellow
P: 3, V+, Scene(ON)
IN7: Pink/Black
P: 3, V+, Low Power 1(ON), Low Power 2(ON)
IN9: Yellow/Black
P: 3, V+, Flash Mode 2(ON)
IN11: Orange
P: 3, V+, FINB1 Flash(ON), FINB2 Flash(ON), FINB3 Flash(ON), FINB4 Flash(C
TA-W1: Warning 1
P: 3, V+, RINB1 Flash(ON), RINB2 Flash(ON), RINB3 Flash(ON), RINB4 Flashi
TA-W3: Warning 3
P: 3, V+, RINB1 Flash(ON), RINB2 Flash(ON), RINB3 Flash(ON), RINB4 Flashi
TA-AR: Arrow Right
P: 3, V+, Rear Arrow Right(ON)
Front Photosensor
P: 3, V+, Low Power 1(ON)
IN2: Violet/White
P: 4, V+, Rear Arrow Left(ON)
IN4: Violet
P: 3, V+, Takedown(ON)
IN6: Light Green
P: 3, V+, TD Flash(ON)
IN8: Yellow/White
P: 3, V+, Front Aux 1(ON)
IN10: Brown
P: 3, V+, RINB1 Flash(ON), RINB2 Flash(ON), RINB3 Flash(ON), RINB4 Flashi
IN12: White
P: 3, V+, Pattern Select(ON)
TA-W2: Warning 2
P: 3, V+, RINB1 Flash(ON), RINB2 Flash(ON), RINB3 Flash(ON), RINB4 Flashi
TA-AL: Arrow Left
P: 3, V+, Rear Arrow Left(ON)
TA-AC: Arrow Center
P: 3, V+, Rear Arrow Left(ON), Rear Arrow Right(ON)
Rear Photosensor
P: 3, V+, Low Power 2(ON)

To test the functionality of the light bars:

1. Turn the Control Simulator on by pressing the red power button on the top bar. When pressed, it will remind the user to make sure the configuration file has been uploaded to the BOB.
2. The user is now able to press the buttons to test the functions of the specified wires, without actually activating the wires. When pressed, the buttons will turn Green. (See Figure 22 - Control Simulator)

Usage as a diagnostic tool:

1. Turn the Control Simulator on by pressing the red power button on the top bar. When pressed, it will remind the user to make sure the configuration file has been uploaded to the BOB.
2. A red box will appear around any wires, or virtual buttons, that are being activated on the BOB.

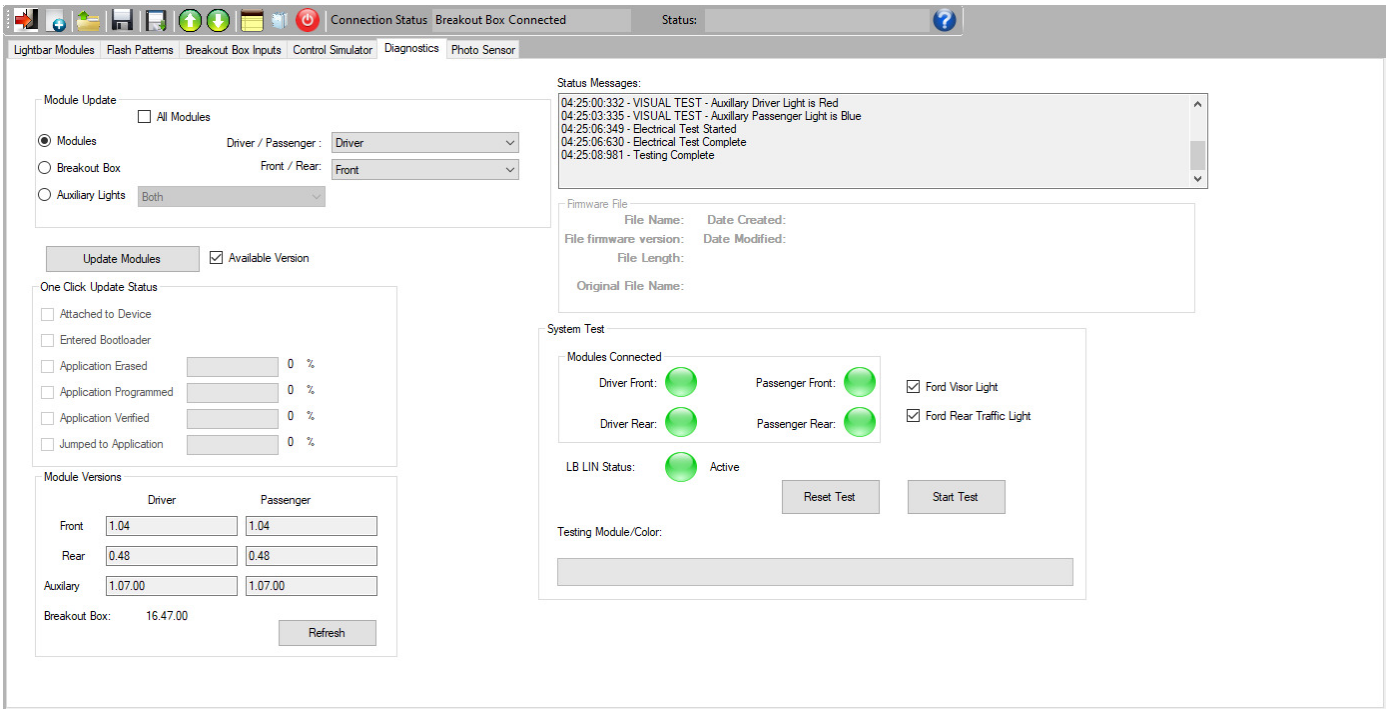
Diagnostics

This window tab is used for updating the firmware of the break out box and the light modules of the light bars. (See Figure 23 - Diagnostics)

Notes:

- The LED's on the breakout box that represent the light modules must be lit for the diagnostic updates and tests to function. If the LED is not lit, the test for connection will be the only test run.
- The terms Front and Visor are representing the same modules.
- The terms Rear and Traffic are representing the same modules.

Figure 23 - Diagnostics



Module Update

This grouping is used to select the items that need to be updated. If you hover the mouse over the "Available Version" heading, it will show the user what the most up to date firmware versions are available in this software. This can be compared to the firmware versions that are displayed under the "Module Versions" group.

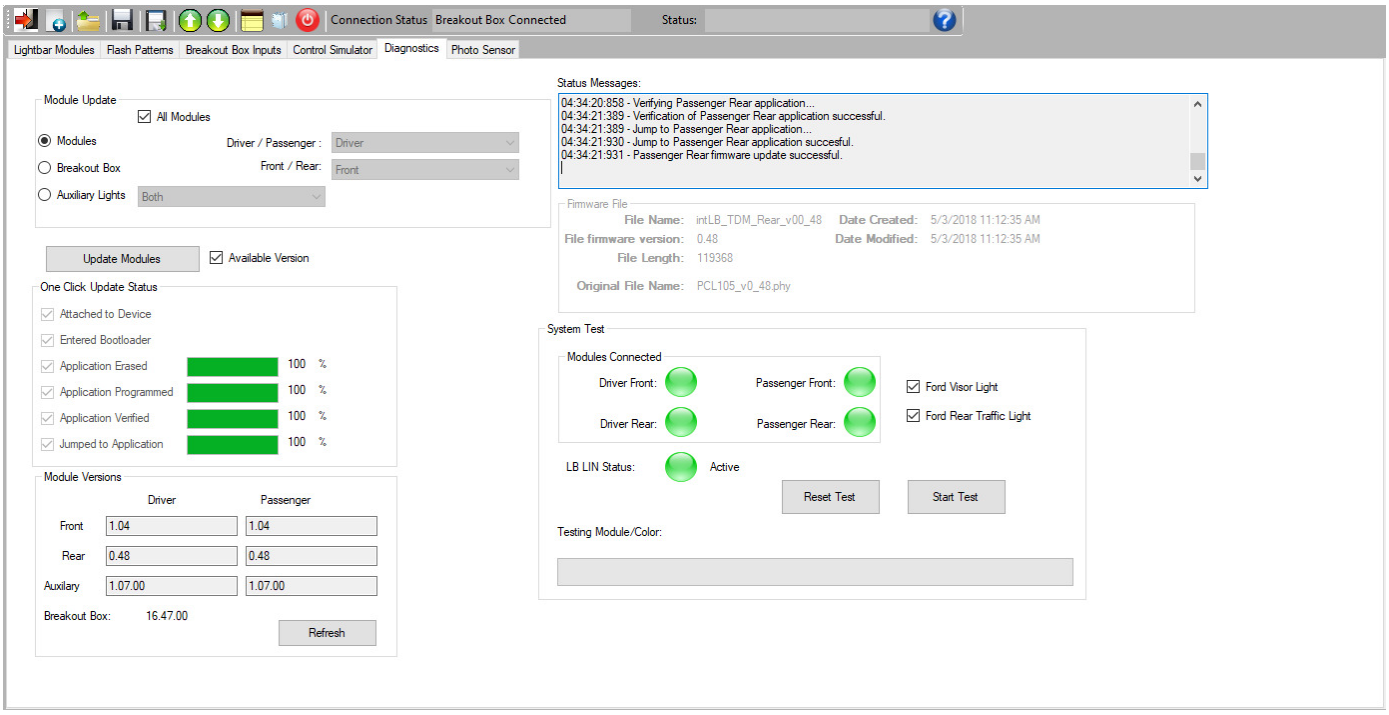
To update the Breakout Box:

1. Make sure Breakout Box is checked
2. Click on "Update Modules" button.
    a. The One Click Update Status grouping will begin to run through its steps, while showing a progress bar for each of the steps.
    b. The Status Message Box will also display the steps that it is running through.

To update the light bar modules:

1. Select individual modules using the drop down menus, or place a check mark in the "All Modules" location to update all modules.
    a. Even if the firmware is the same as the update, it will rewrite the firmware to the device.
2. Click on "Update Modules" button.
    a. The One Click Update Status grouping will begin to run through its steps, while showing a progress bar for each of the steps.
    b. The Status Message Box will also display the steps that it is running through and the results of the steps. (See Figure 24 – Update Results)

Figure 24 – Update Results



System Test

This grouping will allow the user to visually test the light bars for connectivity and visual accuracy.

To run the System Test function:

1. Make the selection of Visor lights, Traffic lights, or both.
2. Click the "Start Test" button.
    a. The light bars will run through a visual test by displaying each color of the bars for the user to view.
3. A "Module results" (See Figure 25 - Module Results) window will appear to show the results of the "Electrical test."

Once the test is complete, if the user wishes to run the test again, they are able to press the "Reset Test" button to clear all of the "Status Messages."

Module Results

Note:

- The Key at the bottom of the window shows the values of the test results in the window.

If a color, or colors, are bad, the module will show those colors. If more than one is bad, it will cycle through them.

If a module is not connected, the modules will show as "Module Not Tested."

Figure 25 - Module Results

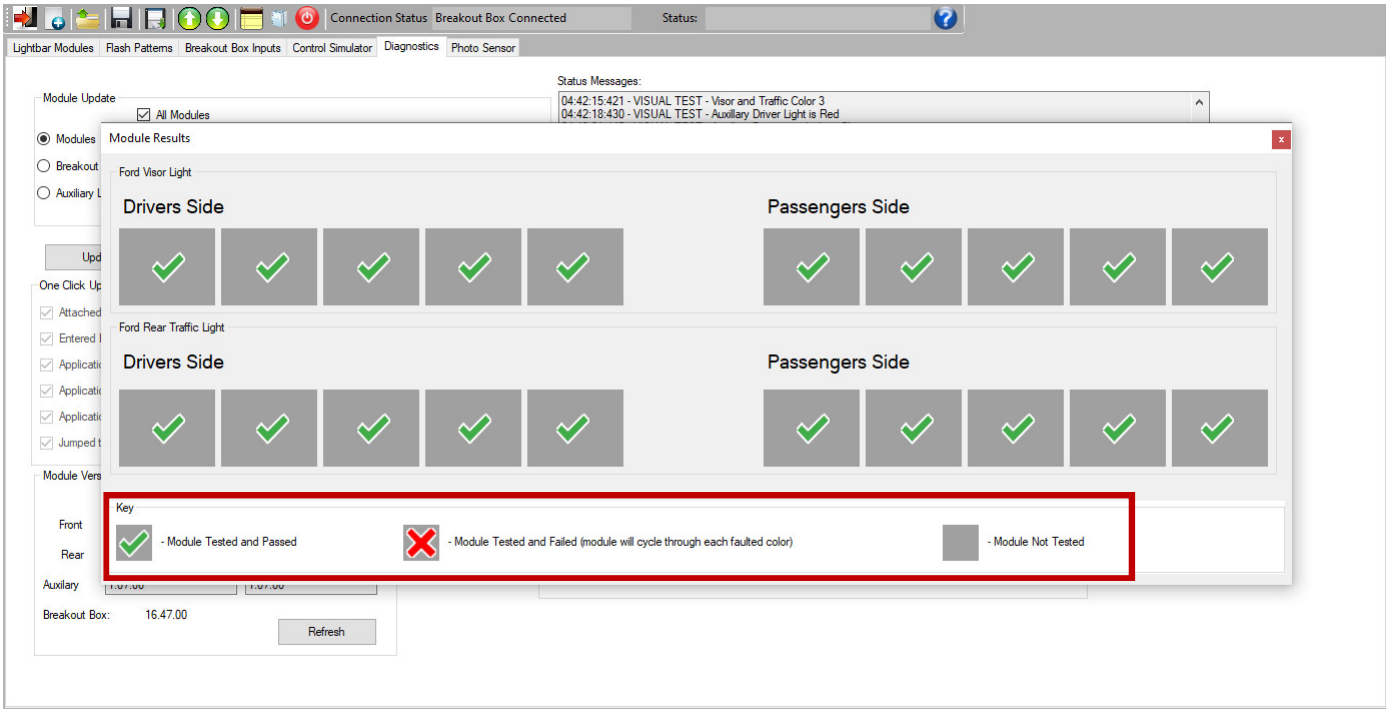


Photo Sensor

This window tab allows the user to set the values needed for activation of the Photo Sensors that are located on each of the light modules. (See Figure 26 - Photo Sensor)

Note:

- Lux value: this is the intensity of the surrounding environment light; i.e. daytime brightness. The greater the intensity, the higher the value.
- The Photo Sensor is always enabled. The function of the Photo Sensor, Low Power, can be disabled in the Breakout Box Inputs tab.
- There are times when you may see weird data. It's because you've caught the breakout box in the middle of its wait or calculation for a good value. You can press the "Retrieve Lux Value" as many times as needed to get more of an average read.

Ambient Light (Set/Clear)

The lux values that are located under this heading are the low end and high end values that will determine when the "Low Power" setting takes effect.

The "Delay" setting is how long the value must be seen before the "Low Power" setting takes effect.

Figure 26 - Photo Sensor